

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all previous listings and versions of claim in this application.

1. (Currently Amended) A method for concurrently producing at least a pair of semiconductor structures that each includes at least one useful layer on a substrate comprising:
providing an initial structure that includes a useful layer having a front face ~~on~~ bonded to a support substrate and having a thickness sufficient to transfer multiple useful layers;
implanting atomic species into the useful layer to a controlled mean implantation depth to form a zone of weakness within the useful layer that defines first and second useful layers;
bonding a stiffening substrate to the front face of the initial structure; and
detaching the first useful layer from the second useful layer along the zone of weakness to obtain ~~a pair of semiconductor structures with a first structure including the stiffening substrate and the first useful layer and a second~~ a semiconductor-on-insulator structure including the support substrate and the a second useful layer, wherein the second useful layer is suitable for electronic, optoelectronic, or optic applications.

2. (Original) The method of claim 1 wherein the implanting includes introducing atomic species through the front face of the useful layer to form the zone of weakness.

3. (Currently Amended) The method of claim 1 wherein the detaching also provides a semiconductor structure that includes a stiffening substrate and the first useful layer, and the first and second useful layers is are provided at a sufficient thickness to provide multiple ~~first and second~~ useful layers during further processing.

4. (Original) The method of claim 3 which further comprises repeating the implanting, bonding and detaching steps on the useful layers of the first and second structures to provide a third and fourth semiconductor structures, with the third structure including a second stiffening substrate and a third useful layer, and the fourth structure including a third stiffening substrate and a fourth useful layer.

5. (Original) The method of claim 4 wherein the first and second useful layers are provided at sufficient thicknesses to provide multiple third and fourth useful layers during further processing.

6. (Currently Amended) The method of claim 4 wherein ~~[[the]]~~ all structures are suitable for use in electronic, optoelectronic or optic applications.

7. (Original) The method of claim 1 which further comprises at least one intermediate layer in the initial structure between the useful layer and the support substrate.

8. (Original) The method of claim 7 wherein the intermediate layer is at least one of silicon dioxide (SiO_2), silicon nitride (Si_3N_4), a high permittivity insulating material, diamond or strained silicon.

9. (Original) The method of claim 1 which further comprises providing an intermediate layer in the second structure between the stiffening substrate and the first useful layer.

10. (Original) The method of claim 9 wherein the intermediate layer is at least one of silicon dioxide (SiO_2), silicon nitride (Si_3N_4), a high permittivity insulating material, diamond or strained silicon.

11. (Original) The method of claim 1 wherein the bonding is achieved by molecular adhesion.

12. (Original) The method of claim 1 wherein at least one of the support substrate, the stiffening substrate, or the useful layer is made of a semiconductor material.

13. (Original) The method of claim 1 wherein the support substrate includes at least one layer made of at least one of silicon, silicon carbide, sapphire, diamond, germanium, quartz, yttrium-stabilized zirconia or an alloy of silicon carbide.

14. (Original) The method of claim 1 wherein the stiffening substrate includes at least one layer made of at least one of silicon, silicon carbide, sapphire, diamond, germanium, quartz, yttrium-stabilized zirconia or an alloy of silicon carbide.

15. (Original) The method claim 1 wherein the useful layer is made of at least one of silicon, silicon carbide, sapphire, diamond, germanium, silicon-germanium, a group III-V compound or a group II-VI compound.

16. (Original) The method of claim 1 wherein the support substrate is made of a single-crystal or poly-crystal silicon, the useful layer is made of a single-crystal silicon, and the stiffening substrate is made of a single-crystal or poly-crystal silicon.

17. (New) The method of claim 1 wherein the useful substrate is molecularly bonded to the support substrate.